

LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) An integrated metal processing facility for forming and heat treating metal castings, comprising:
 - a pouring station for pouring a molten metal into a series of molds to form the castings;
 - a heat treatment unit including at least one heat treatment station for heat treating the castings;
 - a transfer system for moving the castings from said pouring station to said heat treatment unit[[,.]]; and
 - a process temperature control station positioned upstream from said heat treatment station, the process temperature control station comprising:
 - a heat source positioned along a path of travel for the castings for applying heat to the castings ~~prior to introduction of the castings into said heat treatment station to maintain the castings at or above a process control temperature for the metal of the castings; and~~
 - a controller, said controller controlling the amount of heat applied to the castings to maintain the temperature of the castings at or above a process control temperature for the metal of the castings,
- whereby as the castings are moved from said pouring station to said heat treatment unit, the molten metal of the castings is permitted to solidify while the temperature of the castings ~~are~~ is maintained at or above said process control temperature ~~until the castings are introduced into said heat treatment station.~~

2. (original) The integrated metal processing facility of claim 1 and wherein said transfer system comprises a robotic or mechanized arm adapted to grip and move the molds with the castings therewithin from the pouring station to said heat treatment station.
3. (currently amended) The integrated metal processing facility of claim 1 and wherein said ~~heating~~ heat source comprises a heating element mounted to said transfer system for applying heat to the castings during transfer from said pouring station to said heat treatment ~~line-unit~~.
4. (currently amended) The integrated metal processing facility of claim 1 and wherein said ~~further comprising a process temperature control chamber~~ station is positioned adjacent an inlet end of said heat treatment station.
5. (currently amended) The integrated metal processing facility of claim ~~[[4]]~~1 and wherein said process temperature control station comprises a radiant chamber through which the castings are moved and wherein said heat source comprises at least one ~~a series of~~ heating element~~[[s]]~~ mounted along said process temperature control station for supplying heat to said radiant chamber.
6. (currently amended) The integrated metal processing facility of claim 5 and wherein said heating ~~elements comprise~~ element comprises a radiant heater~~[[s]]~~.
7. (currently amended) The integrated metal processing facility of claim 5 and wherein said heating ~~elements comprise~~ element comprises a convection heater~~[[s]]~~.
8. (currently amended) The integrated metal processing facility of claim 5 and wherein said heating ~~elements~~ element comprises a series of burners connected to a fuel supply.

9. (currently amended) The integrated metal processing facility of claim 1 and wherein said heat treatment ~~line~~ unit comprises a furnace having a plurality of furnace chambers each defining a heat treatment station.

10-31. (canceled)

32. (new) The integrated metal processing facility of claim 1, wherein said process control temperature is the temperature below which for every one minute of time the temperature of the castings decreases, more than one minute of heat treatment is required to attain the desired properties of the castings.

33. (new) The integrated metal processing facility of claim 1, wherein the metal is an aluminum/copper alloy and said process control temperature is from about 400°C to about 470°C.

34. (new) The integrated metal processing facility of claim 1, wherein the metal is an iron alloy and said process control temperature is from about 1000°C to about 1300°C.

35. (new) A system for processing castings formed from a molten metal, comprising:
 a pouring station in which the molten metal is poured into a series of molds to form the castings; and
 a heat treatment line downstream from said pouring station, the heat treatment line comprising:
 at least one heat treatment furnace through which the castings are passed for heat treatment thereof; and
 a process temperature control station positioned upstream from said heat treatment furnace, said process temperature control station comprising:
 a heat source positioned along a path of travel of the castings for applying heat to the castings; and

a controller, said controller controlling the amount of heat applied to the castings to maintain the temperature of the castings at or above a process control temperature for the metal of the castings,

whereby as the castings are moved from said pouring station to said heat treatment unit, the molten metal of the castings is permitted to solidify while the temperature of the castings is maintained at or above said process control temperature.

36. (new) The system of claim 35, further comprising a transfer mechanism for transferring the castings from said pouring station to said heat treatment line.
37. (new) The system of claim 36, further comprising a heat source mounted to said transfer mechanism and adapted to apply heat to the castings during transport of the castings from said pouring station to said heat treatment line.
38. (new) The system of claim 35, wherein said heat source comprises a convection heater.
39. (new) The system of claim 35, wherein said heat source comprises a series of burners connected to a fuel supply.
40. (new) The system of claim 35, wherein said heat source comprises a radiant heater.
41. (new) The system of claim 35, wherein said heat treatment line comprises a furnace having a plurality of furnace chambers each defining a heat treatment station.
42. (new) The system of claim 35, further comprising a collection tray for receiving the castings from the pouring station and reciprocally moveable into and out of said process temperature control station as successive castings are placed therein.
43. (new) The integrated metal processing facility of claim 35, wherein said process control temperature is the temperature below which for every one minute of time the temperature

of the castings decreases, more than one minute of heat treatment is required to attain the desired properties of the castings.

44. (new) The system of claim 35, wherein the metal is an aluminum/copper alloy and said process control temperature is from about 400°C to about 470°C.
45. (new) The system of claim 35, wherein the metal is an iron alloy and said process control temperature is from about 1000°C to about 1300°C.
46. (new) An integrated metal processing facility for forming and heat treating metal castings, comprising:
 - a pouring station for pouring a molten metal into a series of molds to form the castings;
 - a heat treatment unit including at least one heat treatment station for heat treating the castings;
 - a transfer system for moving the castings from said pouring station to said heat treatment unit; and
 - a process temperature control station positioned upstream from said heat treatment furnace, the process temperature control station comprising:
 - a chamber through which the castings are passed prior to heat treatment;
 - and
 - a means for arresting cooling of the castings at a temperature at or above a process control temperature while enabling the castings to solidify, wherein said process control temperature is the temperature below which for every one minute of time the temperature of the castings decreases, more than one minute of heat treatment is required to attain the desired properties of the castings, wherein said temperature is maintained at or above said process control temperature as the castings are transferred from said pouring station to said heat treatment unit.

47. (new) The integrated metal processing facility of claim 46, wherein said transfer system comprises a robotic or mechanized arm adapted to grip and move the molds with the castings therewithin from said pouring station to said heat treatment station.
48. (new) The integrated metal processing facility of claim 46, wherein said means for arresting cooling of the castings comprises a heating element mounted to said transfer system for applying heat to the castings during transfer from said pouring station to said heat treatment unit.
49. (new) The integrated metal processing facility of claim 46, wherein said process temperature control station is positioned adjacent an inlet end of said heat treatment unit.
50. (new) The integrated metal processing facility of claim 46, wherein said process temperature control station comprises a radiant chamber through which the castings are moved and wherein said means for arresting cooling of the castings comprises at least one heating element mounted along said process temperature control station for supplying heat to said radiant chamber.
51. (new) The integrated metal processing facility of claim 50, wherein said heating element comprises a radiant heater.
52. (new) The integrated metal processing facility of claim 50, wherein said heating element comprises a convection heater.
53. (new) The integrated metal processing facility of claim 50, wherein said heating element comprises a series of burners connected to a fuel supply.
54. (original) The integrated metal processing facility of claim 46, wherein said heat treatment unit comprises a furnace having a plurality of furnace chambers each defining a heat treatment station.

55. (new) The integrated metal processing facility of claim 46, wherein the metal is an aluminum/copper alloy and said process control temperature is from about 400°C to about 470°C.
56. (new) The integrated metal processing facility of claim 46, wherein the metal is an iron alloy and said process control temperature is from about 1000°C to about 1300°C.
57. (new) A system for processing castings formed from a molten metal comprising:
a pouring station in which a molten metal is poured into a series of molds to form the castings; and
a heat treatment line downstream from said pouring station, the heat treatment line comprising:
at least one heat treatment furnace through which the castings are passed for heat treatment thereof; and
a process temperature control station positioned upstream from said heat treatment furnace, said process temperature control station comprising:
a chamber through which the castings are passed prior to heat treatment; and
a means for arresting cooling of the castings at a temperature at or above a process control temperature while enabling the castings to solidify, wherein said process control temperature is the temperature below which for every one minute of time the temperature of the castings decreases, more than one minute of heat treatment is required to attain the desired properties of the castings, and wherein said temperature is maintained at or above the process control temperature as the castings are transferred from said pouring station to said heat treatment line.
58. (new) The system of claim 57, further comprising a transfer mechanism for transferring the castings from said pouring station to said heat treatment line.

59. (new) The system of claim 58, further comprising a heat source mounted to said transfer mechanism and adapted to apply heat to the castings during transport of the castings from said pouring station to said heat treatment line.
60. (new) The system of claim 57, wherein said means for arresting cooling of the castings comprises a radiant heater.
61. (new) The system of claim 57, wherein said means for arresting cooling of the castings comprises a convection heater.
62. (new) The system of claim 57, wherein said means for arresting cooling of the castings comprises a series of burners connected to a fuel supply.
63. (new) The system of claim 57, wherein said chamber comprises an elongated tunnel having a ceiling and side walls including a radiant material for directing heat toward the castings as the castings are passed therethrough.
64. (new) The system of claim 57, wherein said heat treatment line comprises a furnace having a plurality of furnace chambers each defining a heat treatment station.
65. (new) The system of claim 57, further comprising a collection tray for receiving the castings from said pouring station, the collection tray being reciprocally moveable into and out of said process temperature control station as successive castings are placed therein.
66. (new) The system of claim 57, wherein the metal is an aluminum/copper alloy and said process control temperature is from about 400°C to about 470°C.

67. (new) The system of claim 57, wherein the metal is an iron alloy and said process control temperature is from about 1000°C to about 1300°C.